WE CLAIM:

1. A *P. haemolytica* bacterium which:

a) expresses no biologically active leukotoxin,

b) expresses a form of leukotoxin molecule which induces antibodies which specifically bind to leukotoxin; and

c) contains no foreign DNA.

2. The *P. haemolytica* bacterium of claim 1 wherein the form of leukotoxin molecule expressed is a deletion mutant.

3. The *P. haemolytica* bacterium of claim 2 wherein the deletion mutant is about 66 kD.

4. The *P. haemolytica* bacterium of claim 2 wherein the deletion mutant lacks amino acids 34 to 378.

5. The *P. haemolytica* bacterium of claim 1 wherein the bacterium is *lkt* C^+.

6. The *P. haemolytica* bacterium of claim 1 wherein the leukotoxin operon comprises no antibiotic resistance genes.

7. The *P. haemolytica* bacterium of claim 1 which comprises a mutation in the structural gene *lktA*$^-$ which encodes leukotoxin.

8. The *P. haemolytica* bacterium of claim 1 wherein the bacterium comprises a mutation which is non-reverting, said mutation resulting in the inability of the bacterium to express biologically active leukotoxin.

9. A method of inducing immunity to pneumonic pasteurellosis in ruminants, comprising the step of:

administering the bacterium of claim 1 to a ruminant whereby immunity is induced.

10. The method of claim 9 wherein the step of administering is via the oral route.

11. The method of claim 10 wherein the bacterium is top-dressed on the feed of the ruminant.

12. The method of claim 9 wherein the step of administering comprises injecting the bacterium subcutaneously.

13. The method of claim 9 wherein the step of administering comprises injecting the bacterium intradermally.

14. The method of claim 9 wherein the step of administering comprises injecting the bacterium intramuscularly.

15. The method of claim 9 wherein the step of administering is via the nose.

16. A feed for ruminants which comprises the bacterium of claim 1.

17. A vaccine for reducing morbidity in ruminants, comprising:

a *P. haemolytica* bacterium which:

a) expresses no biologically active leukotoxin,

b) expresses a form of leukotoxin molecule which induces antibodies which specifically bind to leukotoxin; and

c) contains no foreign DNA.

18. A temperature sensitive plasmid which replicates at 30 °C but not at 40 °C in *P. haemolytica* and which has an origin of replication of the same incompatibility group as the plasmid which has been deposited at the ATCC with Accession No. - _____.

19. The temperature sensitive plasmid of claim 16 which is the plasmid which has been deposited at the ATCC with Accession No. _____.

20. A *P. haemolytica* leukotoxin molecule which:

a) is biologically inactive;

b) induces antibodies which specifically bind to leukotoxin; and

c) contains no foreign amino acid sequences.

21. The *P. haemolytica* leukotoxin protein of claim 20 wherein the form of leukotoxin molecule expressed is the result of a deletion mutation.

22. The *P. haemolytica* leukotoxin protein of claim 21 wherein the protein is about 66 kD.

23. The *P. haemolytica* leukotoxin protein of claim 21 wherein the protein lacks amino acids 34 to 378.

24. The *P. haemolytica* leukotoxin protein of claim 20 wherein the leukotoxin protein is acylated.

25. The *P. haemolytica* leukotoxin protein of claim 20 wherein the leukotoxin

protein comprises no antibiotic resistance enzymes.

26. A method of inducing immunity to pneumonic pasteurellosis in ruminants, comprising the step of:

administering the leukotoxin protein of claim 20 to a ruminant whereby immunity is induced.

27. The method of claim 26 wherein the step of administering is via the oral route.

28. The method of claim 26 wherein the leukotoxin protein is top-dressed on the feed of the ruminant.

29. The method of claim 26 wherein the step of administering comprises injecting the leukotoxin protein subcutaneously.

30. The method of claim 26 wherein the step of administering comprises injecting the leukotoxin protein intradermally.

31. The method of claim 26 wherein the step of administering comprises injecting the leukotoxin protein intramuscularly.

32. The method of claim 26 wherein the step of administering is via the nose.

33. A feed for ruminants which comprises the leukotoxin protein of claim 20.

34. A vaccine for reducing morbidity in ruminants, comprising:

a *P. haemolytica* leukotoxin protein which:

a) is biologically inactive;

b) induces antibodies which specifically bind to leukotoxin; and

c) contains no foreign amino acid sequences.